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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/606,319	06/28/2000	Krishna Seshan	042390.P8490	5476

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EXAMINER

WEISS, HOWARD

ART UNIT PAPER NUMBER

2814

DATE MAILED: 07/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/606,319

Applicant(s)

SESHAN, KRISHNA



Examiner

Howard Weiss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 26 and 28 ~~is~~ are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-15, 26 and 28 ~~is~~ are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Attorney's Docket Number: 042390.P8490

Filing Date: 6/28/00

Continuing Data: RCE established 8/18/03 and 9/16/04

Claimed Foreign Priority Date: none

Applicant(s): Seshan

Examiner: Howard Weiss

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji (JP 08-204136) and Ito et al. (U.S. Patent No. 5,847,466).

Tsuji shows most aspects of the instant invention (e.g. Figures 1 and 2) including:

- a bond pad **2** of two or more segments **2a** with a wire lead **6** directly attached
- the segments having the same shape (for example, Figure 2(b) shows the segments having an "F" shape)
- lines **L** electrically connected to said segments

Tsuji does not show the bond pad disposed over and electrically connected to two or more vias. Ito et al. teach (e.g. Figure 2) to disposed over and electrically connect **9** bond pads **6c** to two or more vias **7b** to solve over-etching problems (Column 2 Lines 65 to 67). It would have been obvious to a person of ordinary skill in the art at the time of invention to disposed over and electrically connect bond pads to two or more vias as taught by Ito et al. in the device of Tsuji to solve over-etching problems

3. Claims 1, 6, 7, 10 to 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezawa et al. (U.S. Patent No. 6,404,051) and Takeda et al. (JP 05-013418).

Ezawa et al. show all aspects of the instant invention (e.g. Figure 4) including:

- bond pads **2a-c**
- a passivation layer **3** with vias both disposed over said bond pads
- BLMs **4a-c** comprising upper and lower layers (Column 3 Lines 17 to 20) and disposed over said vias
- bumps **5a-c** disposed directly on said BLMs and in said vias

Ezawa et al. do not show the BLMs split into two or more segments in close proximity to each other, separated by a gap, explicitly providing a diffusion barrier, in a substantially polygonal layout, electrically connected to two or more vias, said vias offset from the center of said bump and in a polygonal layout.

Takada et al. teach (e.g. Figures 4 to 6) to split BLMs **6,7** into two or more segments in close proximity to each other, separated by a gap, in a substantially polygonal layout, electrically connected to two or more vias, said vias offset from the center of said bump and in a polygonal layout to prevent the generation of cracks in the insulating (i.e. passivation) film (see Purpose). It would have been obvious to a person of ordinary skill in the art at the time of invention to split BLMs into two or more segments in close proximity to each other, separated by a gap, in a substantially polygonal layout, electrically connected to two or more vias, said vias offset from the center of said bump and in a polygonal layout as taught by Takada et al. in the device of Ezawa et al. to prevent the generation of cracks in the insulating (i.e. passivation) film.

In reference to the claim language pertaining to the BLM providing a diffusion barrier to metals, the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In*

re Best, 195 USPQ 430, 433 (CCPA 1977) and *In re Swinehart*, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971); see MPEP § 2112. Since Kim shows all the features of the claimed invention, the ability of the BLM to act as a metal diffusion barrier is an inherent property of Ezawa et al. and Takada et al.'s invention.

4. Claims 2 to 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezawa et al. and Takeda et al., as applied to Claim 1 above, and in further view of Tadauchi et al. (U.S. Patent No. 6,464,122).

Ezawa et al. and Takeda et al. disclose the claimed invention (Paragraph 3) except explicitly having the bump's solder comprises lead-tin and tin-silver-copper (i.e. lead free). Tadauchi et al. teach (Column 9 Lines 43 to 55) that these solders are well known in the art. Therefore, because these two solders are well known solders at the time the invention was made, one of ordinary skill in the art would have found it obvious to use either tin-silver-copper or lead-tin.

5. Claims 5, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezawa et al. and Takeda et al., as applied to Claim 1 above, and in further view of Wark et al. (U.S. Patent No. 6,613,662).

Ezawa et al. and Takeda et al. show most aspects of the instant invention (Paragraph 3) except for the bump's upper and lower layers of the stated thicknesses and the use of ECA, Ti and Ni-V. Wark et al. teach (Column 2 Lines 13 to 15 and Column 6 Line 64 to Column 7 Line 16) that these conductors are well known equivalents in the art. Therefore, because these conductors are well known equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to use any of these conductors in the device of Ezawa et al. and Takeda et al.

Since the Applicant has not established the criticality of the thicknesses stated and since these thicknesses are in common use in similar devices in the art, it would have been obvious to one of ordinary skill in the art to use these values in the device of Kim and Takada et al. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

6. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ezawa et al. and Takeda et al., as applied to Claim 1 above, and in further view of Wong (U.S. Patent No. 6,577,017).

Ezawa et al. and Takeda et al. show most aspects of the instant invention (Paragraph 3) except the second bond pad. Wong teaches (Figures 3) to use a second bond pad **24** to transfer stress (Column 1 Lines 53 to 57). It would have been obvious to a person of ordinary skill in the art at the time of invention to use a second bond pad as taught by Wong in the device of Ezawa et al. and Takeda et al. to transfer stress.

Response to Arguments

7. Applicant's arguments with respect to Claims 1 to 15 have been considered but are moot in view of the new ground(s) of rejection. In reference to amended Claim 28, see rejection above.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.
10. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the

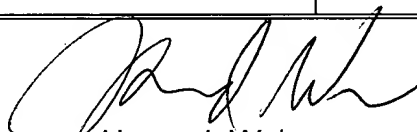
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hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

12. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/737, 774, 781	thru 6/30/05
Other Documentation: none	
Electronic Database(s): EAST	thru 6/30/05

HW/hw
30 June 2005



Howard Weiss
Primary Examiner
Art Unit 2814